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| 10/525,475      | 02/23/2005  | Hein Otto Folkerts   | NL020802US          | 7522             |

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| EXAMINER |
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NADAV, ORI

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| ART UNIT | PAPER NUMBER |
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2811

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02/18/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/525,475 | <b>Applicant(s)</b><br>FOLKERTS ET AL. |  |
|                              | <b>Examiner</b><br>Ori Nadav         | <b>Art Unit</b><br>2811                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-15,18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) 8-12,14,15 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5-7,13 and 20-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the gate of the reset transistor having a length which is longer than the length of the gate of the source follower transistor, as recited in claim 6, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2-3, 5-7, 13 and 20-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support in the elected embodiment of figure 4 for the claimed limitation of "gate region overlaps the source region such that a portion of the source region is sandwiched between the gate region and the well region", as recited in claim 2.

There is no support in the elected embodiment of figure 4 for the claimed limitation of "the gate of the reset transistor having a length which is greater than a length of the gate of the source follower transistor", as recited in claims 6 and 22.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-3, 5-7, 13 and 20-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention

The claimed limitation of the surface being provided with a number of cells, as recited in claims 2 and 6, is unclear as to how a two dimensional element (surface) can be provided with three dimensional elements (number of cells).

The claimed limitation of a well region is present, as recited in claims 2 and 6, is unclear as to were the well region is present.

The claimed limitation of "which well region", as recited in claims 2 and 6, is unclear as to what is meant by the term "which" and to which well region applicant refers.

The claimed limitation of well region extends from the surface into the semiconductor body, as recited in claims 2 and 6, is unclear as to how the well region can extend from the surface into the semiconductor body since the well region is located above the surface of the semiconductor body, as depicted in figures 4b and 4c.

The claimed limitation of well region extends at least partly below the gate region and the well region, as recited in claims 2 and 6, is unclear as to how the well region can extends below itself.

The claimed limitation of "having a first conductivity type", as recited in claims 2 and 6, is unclear as to which element has a first conductivity type.

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The claimed limitation of “the source region extending at least substantially in a doped region”, as recited in claims 2 and 6, is unclear as to how the source region extending in a doped region since figure 4b depicts the source region being located above the doped region.

The claimed limitation of “the gate of the reset transistor”, as recited in claims 6 and 22, is unclear as to whether said gate in the same element as the “gate region” recited earlier, or a different element.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 5, 7, 13 and 20-21, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (6,909,162) in view of Netzer et al. (6,177,293).

Regarding claims 2-3, 5, 7, 13 and 20-21, Wu et al. teach in figure 7 and related text an image sensor comprising:

a semiconductor body 101 having a first conductivity type P and having a surface, the surface being provided with a number of cells,

a cell comprising

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a photosensitive element 103 and a reset transistor 121,

the reset transistor comprising

a source region 123, a drain region 125 and a gate region, the source region and the drain region having a second conductivity type N<sup>+</sup> opposite to the first, the source region of the reset transistor being electrically connected to the photosensitive element, wherein

a well region 105 is present which well region extends from the surface into the semiconductor body 101 and extends at least partly below the gate region and the well region having a first conductivity type P,

the source region 123 extending at least substantially in a doped region 103 of the photosensitive element, the doped region having a second conductivity type N, wherein

the source region 123 extends beyond the doped region 103 of the photosensitive element, wherein

the source region 123 extends into the well region 105, wherein

the drain region 125 extends in the well region 105, wherein

the gate is positioned along an edge (the top surface edge) of the photosensitive element, wherein

the source region 123 extends beyond the doped region 103 of the photosensitive element into the well region 105, wherein

the gate region does not extend beyond the well region, wherein

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an edge of the gate region extending over the source region is disposed adjacent on an edge of the well region, and wherein

the edge of the well region abuts an edge of the photosensitive element, such that the edge of the gate region is adjacent to the edge of the photosensitive element.

Wu et al. do not teach the gate region overlaps the source region such that a portion of the source region is sandwiched between the gate region and the well region.

Netzer et al. teach in figure 2(B) and related text a gate region 227 of a reset transistor 220 overlaps the source region such that a portion of the source region is sandwiched between the gate region and substrate.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a gate region overlaps the source region such that a portion of the source region is sandwiched between the gate region and the well region in Wu et al.'s device in order to improve the device characteristics.

wherein a source follower transistor is present having a gate connected to the source of the reset transistor, the gate of the reset transistor having a length which is greater than a length of the gate of the source follower transistor.



Claims 6 and 22, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Kimura (5,214,683).

Wu et al. teach substantially the entire claimed structure, as applied to claim 1 above except a source follower transistor is present having a gate connected to the source of the reset transistor, the gate of the reset transistor having a length which is longer than the length of the gate of the source follower transistor.

Kimura teaches in figure 1 and related text a source follower transistor 108 is present having a gate connected to the source of the reset transistor 120.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a source follower transistor having a gate connected to the source of the reset transistor, wherein the gate of the reset transistor having a length which is longer than the length of the gate of the source follower transistor, in Wu et al.'s device, in order to improve the characteristics of the device when using the device in an application which requires a circuit comprising a source follower.

### ***Response to Arguments***

Applicant argues that amended figure 2 depicts the gate of the reset transistor having a length which is greater than the length of the gate of the source follower transistor, as recited in claim 6.

Figure 2 is merely a circuit diagram of claimed invention, wherein the drawn length of the gate is not indicative as to the its actual length. Such drawings do not

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provide any structural relationship between the length of the gate and the doped regions in the semiconductor substrate. The gate of the reset transistor having a length which is longer than the length of the gate of the source follower transistor, as recited in claim 6, must be depicted in a cross sectional view of the claimed invention.

Applicant's arguments with respect to claims 2-3, 5-7, 13 and 20-22 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660. The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on 571-272-4670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic  
Business Center (EBC) at 866-217-9197 (toll-free).

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